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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/713,221	11/17/2003	Hiroyuki Umimoto	740819-1039	2455

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EXAMINER	
BLUM, DAVID S	

ART UNIT	PAPER NUMBER
2813	

DATE MAILED: 09/30/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/713,221	UMIMOTO ET AL.	
	Examiner	Art Unit	
	David S Blum	2813	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-9* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-9* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *17 November 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☒ Certified copies of the priority documents have been received in Application No. 09/570,391.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *11/17/03*.
4) ☒ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

This action is in response to the application filed 11/17/03.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1-9 are rejected under 35 U.S.C. 102(e) as being anticipated by Adan (US005401994A).

Assaderaghi teaches the device of claims 1-9 as follows.

Regarding claim 1. A semiconductor device comprising:

a gate electrode **(7)** formed on a semiconductor substrate with a gate insulating film **(4)** interposed therebetween;

a channel region composed of a first-conductivity-type **(P1)** impurity layer formed in a region of a surface portion of the semiconductor substrate located below the gate electrode **(figure 2E)**;

source/drain regions **(13 and 14)** composed of second-conductivity-type impurity layers formed in regions of the surface portion of the semiconductor substrate located on both sides of the gate electrode **(figure 2E)**;

second-conductivity-type extension regions **(19 and 20)** formed between the channel region and respective upper portions of the source/drain regions in contact relation with the source/drain regions **(figure 2E)**; and

first-conductivity-type pocket regions **(P1 and P2)** doped with indium ions **(column 3 line 32)**, and formed between the channel region and respective lower portions of the source/drain regions in contact relation with the source/drain regions and in spaced relation to the gate insulating film **(figure 2E, any region would have a spaced relation to another).**

Regarding claim 2. The semiconductor device of claim 1, wherein a dose of the indium ions in the pocket regions is 5 x 10sup 13/cm2 or less **(column 3 line 33, 1x10sup12 to10sup13/cm2 reads on this limitation)**.

Regarding claim 3. The semiconductor device of claim 1, wherein a dose of the indium ions in the pocket regions is between 1 x 10sup12/cm2 and 5 x 10sup13/cm2 **(column 3 line 33, 1x10sup12 to10sup13/cm2 reads on this limitation)**.

Regarding claim 4. The semiconductor device of claim 1, wherein a dose of the impurity ions in the channel region is between 4 x 10sup12/cm2 and 1 x 10sup13/cm2 **(1-5x10sup12/cm2, column 3 line 11)** .

Regarding claim 5. The semiconductor device of claim 1, further comprising a first-conductivity-type well region formed in the semiconductor substrate,
wherein the channel region is formed in the surface region of the semiconductor substrate and over the well region, and has an impurity ions concentration higher than the impurity ions concentration of the well region **(Adan figure 1E, channel is P and well is P-)**.

Regarding claim 6. The semiconductor device of claim 1, wherein the channel region is composed of boron ions or indium ions **(column 3 lines 1-2)**.

Regarding claim 7. A semiconductor device comprising:

a gate electrode **(7)** formed on a semiconductor substrate with a gate insulating film **(4)** interposed therebetween;

a channel region composed of a first-conductivity-type **(P1)** impurity layer formed in a region of a surface portion of the semiconductor substrate located below the gate electrode **(figure 2E)**;

source/drain regions **(13 and 14)** composed of second-conductivity type impurity layers formed in regions of the surface portion of the semiconductor substrate located on both sides of the gate electrode **(figure 2E)**;

second-conductivity-type extension regions **(19 and 20)** formed between the channel region and respective upper portions of the source/ drain regions in contact relation with the source/drain regions **(figure 2E)**;

first-conductivity-type pocket regions **(P2 and P3)** formed between the channel region and respective lower portions of the source/drain regions in contact relation with the source/drain regions and in spaced relation to the gate insulating film **(figure 2E, any region would have a spaced relation to another)**; and

first-conductivity-type lightly doped channel regions formed in both side portions of the channel region in contact relation with the extension regions, each of the lightly doped channel regions containing an activated impurity at a concentration lower than in a center portion of the channel region **(center portion 5x10sup12/cm2 (column 3 line 11), side portions 1x10sup12/cm2 (column 3 line 34), thus side portions may be of a higher concentration than the center portion)**.

Regarding claim 8. The semiconductor device of claim 7, wherein the channel region contains indium ions **(column 3 lines 1-2)**.

Regarding claim 9. A semiconductor device comprising:

a gate electrode **(7)** formed on a semiconductor substrate with a gate insulating

film **(4)** interposed therebetween;

a channel region **(P1)** composed of a first-conductivity-type impurity layer doped with indium ions **(column 3 lines 1-2)** and formed in a region of a surface portion of the semiconductor substrate located below the gate electrode **(figure 2E)**;

source/drain regions **(13 and 14)** composed of second-conductivity-type impurity layers formed in regions of the surface portion of the semiconductor substrate located on both sides of the gate electrode **(figure 2E)**;

second-conductivity type extension regions **(19 and 20)**formed between the channel region and respective upper portions of the source/drain regions in contact relation with the source/drain regions **(figure 2E, any region would have a spaced relation to another)**; and

first-conductivity-type lightly doped channel regions formed in both side portions of the channel region in contact relation with the extension regions, each of the lightly doped channel regions containing an activated impurity at a concentration lower than in a center portion of the channel region **(center portion 5x10sup12/cm2 (column 3 line 11), side portions 1x10sup12/cm2 (column 3 line 34), thus side portions may be of a higher concentration than the center portion)**.

Conclusion

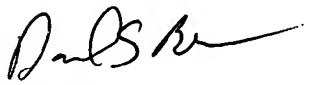
3. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Assaderaghi (US006686629B1) reads on claims 1-3 and 6 but could be overcome with a certified translation of the priority document.

4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to David S. Blum whose telephone number is (571)-272-1687) and e-mail address is David.blum@USPTO.gov .

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carl Whitehead Jr., can be reached at (571)-272-1702. Our facsimile number all patent correspondence to be entered into an application is (703) 872-9306. The facsimile number for customer service is (703)-872-9317.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



David S. Blum

September 28, 2004